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ABSTRACT

Although alcoholism is a focus of public concern and scientific interest, knowledge of the long-term patterns of alcohol abuse is only fragmentary. Subjects in a four-year followup study were alcoholics initially treated at special alcoholism treatment centers funded by the National Institute on Alcohol Abuse and Alcoholism. These centers were established to demonstrate the efficacy of a comprehensive, integrated, professionally organized treatment environment. Results indicate that alcoholism is a continuing condition for the majority of patients. Remissions, while frequent, are generally intermittent rather than stable and occur in two forms: long-term abstention and non-problem drinking. An examination of the alcoholic's life apart from drinking reveals only modest improvements in social adjustments; in this sample, social rehabilitation did not occur as frequently as remission. Alcohol dependence is a dimension of preeminent importance, and plays a significant role in the course of alcoholism. Further advances in prevention and treatment of alcoholism will require a better understanding of the processes underlying the patterns of remission and relapse. (Author/CS)

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PATTERNS OF ALCOHOLISM OVER FOUR YEARS

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Although alcoholism is a focus of public concern and scientific interest, our knowledge of the *long-term* patterns of alcoholism is only fragmentary. For example, there exists scant scientific information on the long-term prognosis for alcoholics after treatment, and even less information on the natural history of the disorder in the absence of treatment [1]. It was for these reasons that the Rand Corporation began, in 1976, a longitudinal study of the course of alcoholism over four years, conducted under contract to the National Institute on Alcohol Abuse and Alcoholism (NIAAA).† The comprehensive study report, *The Course of Alcoholism: Four Years After Treatment* [2], was published as a Rand report in January 1980.

The four-year followup study grew out of a series of NIAAA-sponsored research efforts focused on a large national cohort of alcoholics. The cohort's history is represented in Fig. 1. This same cohort formed the basis for a previous Rand report [3], published in 1976, and for a later book [4]. The subjects were alcoholics who were initially treated at special Alcoholism Treatment Centers funded by NIAAA in 1973. These centers were originally established in the early 1970s as part of NIAAA's mission to demonstrate the concept of a comprehensive treatment center, where alcoholics could obtain all types of treatment within an integrated, professionally organized environment.

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*Revised version of a briefing presented to the National Advisory Council of the National Institute on Alcohol Abuse and Alcoholism, Washington, D.C., January 28, 1980. The results presented here are much more fully elaborated in our report [2].

†The four-year followup study was supported by NIAAA Contract ADM-281-76-0006.

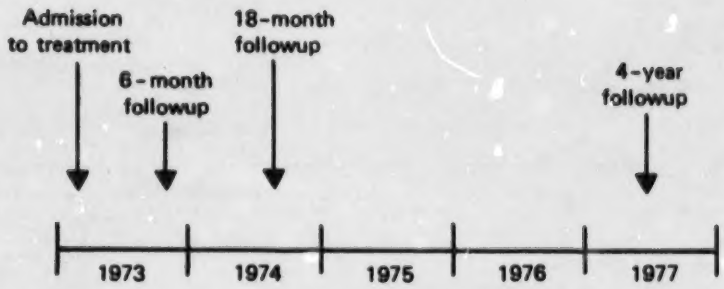

Fig. 1 — Research background

The treatment centers themselves conducted followups of patients at six months after admission; NIAAA also sponsored the special 18-month followup study of a selected subset of patients in 1974 [5]. Partly to test those findings at a later point, and partly to extend our knowledge of a' holism over a longer period, NIAAA asked Rand to conduct a new stu esulting in a four-year followup carried out in 1977. In the four-year study, the focus of interest shifted away from treatment evaluation toward the task of specifying the patterns of alcoholism, as they develop over time.

The four-year study addressed a large number of research questions, including both methodological issues and substantive issues about the nature of alcoholism. This paper presents results from three of the principal study areas, comprising the most important findings of the research. The first area is *the status of the cohort at four years:* that is, the overall condition of this group of alcoholics. This includes the types of drinking behavior found at the four-year point, certain developmental patterns of drinking behavior, and the extent of mortality between admission to treatment and the four-year followup.

Second, this paper examines the overall *social and psychological adjustment* of the cohort, apart from drinking behavior itself. The four-year study collected a variety of psychosocial measurements to describe the subjects in terms of broad aspects of human functioning. The most important question here is one of *rehabilitation*: How much improvement in social characteristics can be observed at four years, compared to the debilitated conditions that were prevalent when these subjects were admitted to treatment?

Third, this paper addresses *patterns of relapse*. The relapse process is highly relevant to both traditional and modern conceptions of alcoholism, and the four-year study expended considerable effort in studying it over time. The discussion here will describe the patterns that appeared at four years and the models that were used to predict conditions under which relapse occurs.

STATUS OF THE COHORT AT FOUR YEARS

Table 1 shows the basic results from the field work on the four-year followup cohort. The data were obtained from a sample of 922 male alcoholics who were initially admitted to a set of eight NIAAA-funded Alcoholism Treatment Centers early in 1973. At four years, the study team returned to the members of this cohort and obtained complete data on 85 percent. By comparison, in the 18-month study data were obtained on only 62 percent of the target sample.

Note that a substantial proportion of the completions at four years were cases of mortality, which will be examined in more detail below. In addition, there were 15 percent of the baseline sample on whom we could not obtain complete data at the followup. Extensive analysis of those persons was conducted, using various data sources to determine whether their lack of data might lead to nonresponse biases. That analysis is included in our main study report [2]. Although space does not permit further detail here, the results show that our findings are unlikely to be affected by more than two percentage points because of nonresponse.

Mortality

Mortality is an essential factor to be considered in any alcoholic group studied over a long period of time. We determined mortality by obtaining official death certificates from the states. The first row of Table 2 shows the overall mortality rate for the study sample, properly weighted. It indicates that 14.5 percent of the original cohort died between admission to treatment and the four-year followup point. For comparison, Table 2 also shows the expected rate of mortality from general U.S. population life tables, after adjusting the general population to the age, race, and sex distribution of the sample, which averaged 45 years of age and was 85 percent white. After adjustment, the expected mortality rate is 5.9 percent. Thus, the actual mortality rate is elevated by about 8 percentage points, which constitutes a ratio of 2-1/2 times as many deaths as would have been expected in a nonalcoholic cohort.

Table 1

FIELD WORK RESULTS

Fieldwork Results at Four Years	Number of Cases	
Interviewed	668	85% Completions
Deceased	113	
Not Completed	141	
Total Sample	(922)	

Table 2

ESTIMATED MORTALITY RATES
(In Percent)

Cause of Death	Study Sample[a]	U.S. Population[b]	Ratio
Deaths from all causes	14.5	5.9	2.5
Deaths from specific causes[c]			
Alcoholism	0.6	.003	21.0
Suicide	2.3	.11	20.9
Cirrhosis	1.6	.2	8.0
Accident	2.0	.4	5.0
Alcohol-related deaths[d]	8.2		

[a]Percent of all subjects admitted to treatment (N = 758) who died before the followup.

[b]Based on age- and race-specific mortality rates for males in the general U.S. population, standardized on the sample age and race distributions.

[c]Underlying causes coded according to the methods of the National Center for Health Statistics.

[d]Deaths for which alcoholism, alcohol toxicity, liver disease, or gastrointestinal bleeding was listed as a cause or contributing factor on the official death certificate; or for which a collateral informant reported that the subject was drinking before death and that alcohol was a factor in the death.

We also looked carefully at the specific causes of death and other contributing factors, as recorded by medical examiners on the official death certificates. The second panel of Table 2 shows that conditions that are classically prominent in alcoholic mortality studies were also prominent here [6]. For example, many certificates indicated the cause of death was "chronic alcoholism." The rate of such deaths was 21 times as high in this population as would be expected in the general population. There were also very high rates of suicide, liver cirrhosis, and accidents.

These findings are important, but in our view they do not delve far enough into the causes of alcoholic mortality. The reason is that the results shown above are based on standard classification methods used by the World Health Organization and the National Center for Health Statistics. These methods reflect the "underlying cause of death," which is coded by a series of complex procedures related to causal linkages in the immediate circumstances of mortality. Although these standard procedures are useful for vital statistics purposes, from a research viewpoint they nevertheless omit certain valuable information. For example, we found cases who died because of heart disease, but for whom chronic alcoholism was also recorded on the death certificate as a contributing factor. Because the official coding rules do not recognize a linkage of alcoholism with heart disease, the standard classification method did not classify such deaths into categories that are unambiguously related to alcohol.

For that reason, we developed our own method of classifying deaths according to a criterion determining whether or not they were "alcohol related." This method took into account all mentions on the death certificate of any alcohol-related problems. In addition, the method used information from local informants in the community who knew the circumstances of death (usually a spouse, relative, or friend) to determine whether, for example, an accident was related to alcohol or not. Under this method, eight percent of our baseline sample were classified as dying because of an "alcohol-related" cause. Note that the rate of eight percent matches very closely the difference between the actual mortality rate and the expected rate. Therefore,

the alcohol-related classification appears to account for the excess mortality of this sample.

Alcohol Problems Among Survivors

Although mortality is a complicated matter, determining alcohol-related problems among survivors, if anything, is even more complicated because of the numerous variations in types of problems, time frames, and related factors. Our method of classifying the status of survivors was to determine the presence or absence of serious alcohol-related problems during the six months before the followup interview. For example, if a subject was interviewed in July 1977, we examined his behavior during the six months before the interview, from January to June of 1977. The measurements involved two different types of alcohol problems that represent divergent methods of diagnosing alcoholism, as shown in Table 3.

The first method uses measures of *alcohol dependence*, or the "alcohol dependence syndrome"--represented by symptoms such as gross tremors because of alcohol withdrawal, morning drinking to forestall withdrawal, uncontrolled drinking, blackouts and the like. Our procedure counted a subject as having a serious, continuing alcohol problem if he had an instance of one or more of these symptoms in the 30-day period before his last drink, provided he drank in the past six months.

A second diagnostic method frequently used--sometimes when a measurement of dependence symptoms is lacking--is to examine adverse consequences of drinking. The four-year followup interview inquired into a variety of serious consequences of drinking that might have occurred during the six-month period before the interview. The list included health problems, such as liver disease or hospitalization because of drinking; arrests, accidents, and other law enforcement incidents due to drinking; and work or interpersonal problems, such as being unemployed, frequently missing work, or having frequent fights because of drinking. As shown in Table 3, the study treated one or more of these events during the six-month period as an indication of an alcohol problem at the time of the four-year followup. That is,

Table 3

ALCOHOL PROBLEMS

Dependence Symptoms[a]	
-- Tremors -- Morning drinking -- Uncontrolled drinking -- Blackouts -- Missing meals -- Continuous drinking (12 hours or more)	1 or more symptoms (30 days before last drink)
Adverse Consequences[b]	
-- Health problems -- Law enforcement incidents -- Work/interpersonal problems	1 or more events (6 months before followup)

[a]Tremors, morning drinking, loss of control, blackouts, and missing meals were ascertained from a subject's report of the number of days, during the 30-day period before his last drink, on which each symptom occurred. Continuous drinking was ascertained from the subject's report of whether or not his *longest period* of continuous drinking was 12 hours or more during the same 30-day period.

[b]Health problems included liver disease; hospitalization because of drinking; receipt of medical advice to stop drinking; and experience of any alcohol-related disease episodes (pancreatitis, bleeding, or DTs). Law enforcement problems included any arrest for drinking and driving or any time in jail connected with drinking. Work/interpersonal problems included being currently unemployed because of a drinking problem; missing work on 2 or more days because of drinking in the 30 days before the last drink; or having "arguments or fights" while drinking on 2 or more days in the same 30-day period.

the occurrence of any single incident from the list would classify a subject into a problem category. In fact, few people in this sample experienced only one such problem. When alcohol-related problems occurred, they usually occurred in multiple instances.

The complexity in classifying drinking behaviors arises principally from variability of these behaviors over time. Even during a period as short as six months, it is difficult to determine unambiguously an individual's proper classification as, for example, a drinker versus an abstainer. Our procedure was, first, to begin with people who at the time of the followup were either currently drinking or currently abstaining, as shown at the left in Fig. 2. For those drinking, of course, the classification of alcohol problems is simple; one can simply distinguish those people drinking without problems from those who reported one or more problems. For abstainers, the situation is a little more complicated. The complication occurs because some people abstained for a short time during the six-month period, but nonetheless had severe alcohol problems during their last drinking period. For these "short-term abstainers," shown in the lower middle of Fig. 2, the interview obtained detailed information on drinking behavior during the 30-day period before their last drink. Based on their behavior during that period, they were classified as either having alcohol problems or being problem-free.

The addition of this information on short-term abstainers proved very significant. In the 18-month followup study [4], no data were available on the drinking of short-term abstainers; all that was known was that they had been abstaining for one month or more. At four years, the data revealed that when short-term abstainers last drank, the great majority of them fell into an alcohol-problem category. Eighty-five percent of the short-term abstainers had a serious alcohol problem at the time of the four-year followup; in fact, the problem rate was higher among short-term abstainers than it was among current drinkers.

For general classification purposes, the four-year followup study combined the various groups indicated in Fig. 2 into a set of three major categories: long-term abstainers, nonproblem drinkers, and problem drinkers, as shown at the lower left. Table 4 shows the

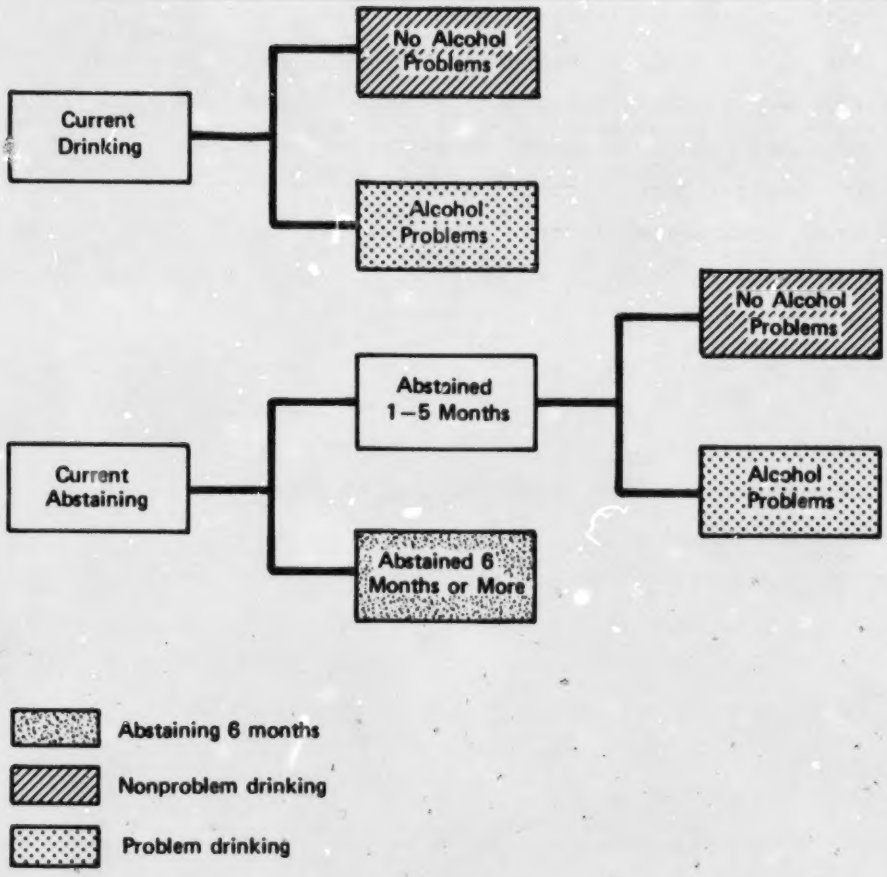

Fig. 2 — Drinking status in past 6 months

Table 4

DRINKING STATUS AT FOUR YEARS

Drinking Status	Percent Distribution[a]	
Abstaining 6 months or more	28	46% Remission
Nonproblem Drinking	18	
Problem Drinking	54	
(N)	(548)	

[a]Among survivors interviewed at four years.

resulting distribution among survivors. It identifies two categories of "remission" at four years: long-term abstainers, who constitute 28 percent of the sample, and nonproblem drinkers, who make up 18 percent. Thus, altogether, 46 percent of the sample were in remission at the four-year followup. The other 54 percent were classified in a problem drinking category.

Clearly, the criteria that we used for assessing a drinking problem were fairly stringent. This stringency, however, was not arbitrary; rather, it was based on conclusions from longitudinal analysis that suggested the criteria. Our approach to the criterion problem was to carry out a longitudinal analysis in which subjects were first classified into categories according to their drinking status at an early followup; then, we calculated the percentage of each category who had an alcohol-related problem at a later point. For example, in the upper panel of Table 5, long-term abstainers and short-term abstainers were distinguished at 18 months. For each group, Table 5 shows the percentages who had one or more adverse consequences at four years, who had any dependence symptoms at four years, and who died of an alcohol-related cause between the 18-month followup and the four-year followup. The long-term abstainers had a relatively good prognosis on all of these measures, whereas those who had previously been short-term abstainers were much more likely to experience later problems. In particular, short-term abstainers were nine times as likely to die of an alcohol-related cause.

The other finding in Table 5 is that alcohol dependence symptoms play a crucial role among drinkers. In the lower panel of Table 5 are shown two categories of drinkers: subjects who drank without any symptoms at 18 months, and subjects who had at least one symptom. Symptomatic drinkers had very poor prognoses. In the comprehensive study report [2], we have shown a more detailed analysis of the level of symptomatology within the symptomatic-drinker group, indicating that subjects who experienced even low levels of symptoms after treatment had very high rates of later problems. These results dictated the adoption of a very stringent criterion for remission, which treated even a single symptom as an indication of a serious problem with an adverse prognosis.

Table 5

ALCOHOL-RELATED CONDITIONS AT FOUR YEARS

Status at 18 Months	Percent with Specified Condition at 4 Years			
	Adverse Consequences[a]	Dependence Symptoms[b]	Alcohol-Related Deaths	(N)
Abstained 6 months or more	31	23	1	(140)
Abstained 1-5 months	52	43	9	(124)
Drank without symptoms	27	34	3	(103)
Drank with symptoms	61	71	9	(223)

[a] One or more consequences of drinking.

[b] One or more dependence symptoms.

SOCIAL AND PSYCHOLOGICAL ADJUSTMENT

The four-year followup study examined the social and psychological characteristics of the cohort, in addition to drinking behavior. Our objective in doing so was partly to map any changes in social adjustment that might have occurred since admission to treatment, and partly to determine whether improvements in drinking behavior were related to possible improvements in social or psychological functioning. Table 6 shows a number of social adjustment characteristics at three points in time: admission, 18 months, and four years. It also includes comparative data from the general U.S. population within the relevant demographic categories. Obviously, the alcoholic cohort was much more maladjusted at admission to treatment than the U.S. population on all of these measures. Moreover, the cohort was still maladjusted at the time of the followups; there was very little change in these variables. The data did show a small amount of improvement in employment and earnings over time (using constant-dollar earnings, with inflation controlled); the percentage of people earning less than $500 decreased by 10 percentage points, and the unemployment rate, as a fraction of the total sample, also decreased by 10 points. However, these are not large changes, especially in comparison with the general population rates.

The four-year followup study also collected information about the psychological characteristics of the sample. Unfortunately, no psychological data were obtained at the earlier time points; such factors were measured only at four years. Table 7 shows the percentage who reported high frequencies of psychiatric symptoms at the four-year followup, within categories of subjects classified according to their drinking behavior at four years: long-term abstainers, nonproblem drinkers, and problem drinkers. The results show, first of all, that the rates of psychiatric symptoms are much higher in all of the alcoholic groups than they are in the general population, judging by the items on which we have general-population data.

The second point about Table 7 is the fact that the rates of psychiatric symptoms for the problem-drinking group are much higher than for the two remission groups--long-term abstainers and nonproblem

Table 6

SOCIAL CHARACTERISTICS AT THREE TIME POINTS
(Percent)

Characteristic	Alcoholic Sample[a]			General Population[b]
	1973 Admission to Treatment	1974 18-Month Followup	1977 4-Year Followup	
Divorced/separated	37	38	36	8
Earnings less than $500/month	70	64	60	14
Unemployed	24	19	14	3

[a]Subjects interviewed at all 3 time points (N = 474).

[b]U.S. Census data, 1977, males 45-55.

Table 7

PSYCHIATRIC SYMPTOMS

Drinking Status at 4 Years	Percent with High Frequency[a]				(N)
	Depression	Tension and Stress	Anxiety	Cognitive Impairment	
Abstaining 6 months or more	8	13	10	4	(155)
Nonproblem drinking	9	16	8	2	(99)
Problem drinking	20	33	27	18	(291)
General population[b]	2	4	[c]	[c]	(2235)

[a]Percent reporting that "most or all of the time" in the 6 months before the 4-year followup they "felt downhearted, blue, or depressed"; "felt tense or high-strung"; "felt anxious, worried, or upset"; and were bothered by "memory problems" or "problems concentrating."

[b]Subjects in Rand's National Health Insurance Study, general-population sample of Seattle, Washington.

[c]Not available.

drinkers. On the other hand, the two remission groups are not distinguishably different in the frequency with which they report psychiatric symptomatology. We do find, then, a correlation between remission of drinking problems and an absence of psychiatric problems. However, we cannot determine whether a subject's level of psychiatric symptoms is an effect or a cause of remission, because all of these data were collected at a single point in time.

Perhaps the most important aspect of Table 7 is the *lack* of differences in psychiatric symptomatology between long-term abstainers and nonproblem drinkers. The fact that these two categories are equal with respect to mental health, in addition to being free of drinking problems, supports our interpretation that both groups should be considered as representing modes of remission.

A quite different pattern is shown by Table 8, which examines *beliefs* about alcoholism, not general mental health. In the domain of beliefs, we find a large difference between the nonproblem drinkers and the abstainers. Interestingly, we also find that abstainers and problem drinkers have common beliefs. Both the abstaining group and the problem-drinking group accept traditional beliefs about alcoholism, such as "alcoholism is an irreversible disease." Not surprisingly, the nonproblem drinkers reject such statements.

The same pattern appears even more clearly in Table 9, which shows items that our subjects were asked to apply to themselves. For example, subjects were asked, "Do you think of yourself as an alcoholic now?" [at the time of the four-year follow-up]; and, "Do you think that you will experience serious harm if you drink in the future?" Once again, the nonproblem drinkers reject all of those notions, but the problem drinkers and abstainers accept them. Note that a high proportion of the problem drinkers accept the belief that they are alcoholics, and assert that they will be seriously harmed by future drinking; nonetheless, they continue to drink. This is one instance in which our data show commonalities between problem drinkers and abstainers in certain belief systems and behavior patterns. These findings

Table 8

BELIEFS ABOUT ALCOHOLISM

Drinking Status at 4 Years	Percent Agreeing with Statement			(N)
	Alcoholism is an Irreversible Disease	Once an Alcoholic, Always an Alcoholic	Alcoholics Cannot Resume Moderate Drinking	
Abstained 6 months or more	61	75	82	(155)
Nonproblem drinking	31	36	47	(99)
Problem drinking	59	67	69	(291)

Table 9

ALCOHOLIC SELF-CONCEPT

Drinking Status at 4 Years	Percent in Agreement			(N)
	Alcoholic Now	Serious Harm from Future Drinking	Death from Future Drinking	
Abstained 6 months or more	69	92	28	(155)
Nonproblem drinking	21	29	0	(99)
Problem drinking	65	68	16	(291)

suggest that an important personality feature of many alcoholics may be the tendency to perpetuate self-destructive behavior in the face of seemingly incongruent attitudes and beliefs.

RELAPSE PATTERNS

Relapse is a very important phenomenon in the study of alcoholism. Its importance stems, first, from its frequency. As will be shown below, relapse is common in this sample, and remissions are generally intermittent rather than stable. But relapse is also important because of its *conceptual* status. The empirical phenomena of relapse bear on fundamental theoretical issues in alcoholism. In fact, a number of different theories of alcoholism are directly related to conceptions of the relapse process. At least three of these conceptions are crucial, both to scientific research and to public understanding of alcoholism.

The first conception of relapse represents the oldest and most widely accepted theory of alcoholism. It holds that *any drinking leads to immediate relapse*. The theory is based on the proposition that alcoholics are different from other people: they are distinguished by the characteristic that when they drink, they lose control of drinking [7]. Indeed, loss of control is the hallmark of an alcoholic in many conceptions of alcoholism. In this view, an alcoholic seems to experience an immediate need for more alcohol as soon as he begins to drink; the first drink sets up a "chain reaction" which leads to further drinking which itself induces a greater need for alcohol [8]. This assertion is not entirely consistent with results of experimental studies, which have shown that when alcoholics are given alcohol under controlled conditions they do not necessarily launch into immediate uncontrolled drinking [9]. Nonetheless, this conception is still the dominant one among treatment professionals and the public.

The second conception represents a revision of the first one. Because of experimental results and other observations of drinking among alcoholics, a revision was made to conceptualize loss

of control not as an inherent or inevitable process, but as something that occurs with a very high probability [10]. Thus, among alcoholics, *any drinking, even nonproblem drinking, will eventually lead to relapse.* The argument made here is that even though relapse may not occur immediately, whenever drinking occurs the alcoholic runs a high risk of relapse. Over the long term, therefore, one should find high rates of relapse among nonproblem drinkers, and low rates of relapse among abstainers. A large differential relapse rate between the two remission groups is a crucial prediction of the theory.

A different conception is represented by a third formulation: namely, that *the risk of nonproblem drinking varies among subgroups.* This conception, although suggested by some recent data [11], has not yet been fully formalized. It suggests that the notion that loss of control is universal throughout the alcoholic population may have been too simple. In fact, the population may be heterogeneous, and the risks of drinking, compared with the risks of abstention, may vary with different characteristics of subgroups. For example, some recent research work on alcoholism has distinguished different degrees of alcohol dependence [12]. This represents a trend toward thinking of dependence as a variable property which may range from zero to some very high value, rather than as a strictly categorical attribute (present or absent).

Our data bear directly on these three different conceptions of the relapse process. Both in the 18-month study and in the four-year study we examined relapse rates by defining four relapse analysis groups, identified by their drinking behavior at one point: long-term abstainers, short-term abstainers, nonproblem drinkers, and problem drinkers. Each group's behavior was then examined at a later point to determine rates of relapse. Table 10 shows the relapse rates that were published at 18 months in the *Alcoholism and Treatment* report [4]. Subjects were classified into relapse analysis groups according to their status at a six-month followup; the table shows the proportion of each group that had relapsed as of the 18-month followup, using the definition employed in that report. The results show, first of all, a very high rate of continuing relapse among problem drinkers; but

Table 10

RELAPSE RATES AT 18 MONTHS

	Status at 6 Months			
	Abstaining 6 Months or More	Abstaining 1-5 Months	"Normal" Drinking[a]	Problem Drinking
Relapse Rate at 18 Months[b] (percent)	17	19	13	43
(N)	(40)	(99)	(30)	(51)

[a] As defined in 18-month study [4].

[b] Percent relapsing into a "nonremission" state at 18 months, as defined in [4], p. 105.

no significant differences are revealed among the three other groups. This finding is the one that appeared to contravene traditional theories and hence, received disproportionate attention in discussions of the 18-month study [4].

The four-year followup presented an opportunity to reexamine this question with more complete data. Table 11 presents the results at four years. In this table, subjects are classified according to their behavior at 18 months: long-term abstaining, short-term abstaining, nonproblem drinking, and problem drinking. The table shows relapse rates among survivors at four years and rates of alcohol-related death. The first notable aspect of this table is that relapse rates are higher at four years than at 18 months. This is strictly a definitional change, reflecting our more stringent criteria in the four-year followup study. Indeed, if we use the same definition, we find the same rates of relapse at 18 months and four years. Although the underlying patterns have not changed substantially, the new definitions indicate more relapses than we were able to observe in the earlier data.

The more important aspects of Table 11 are those represented by comparisons of relapse rates among the four groups. The short-term abstainers are shown to have high rates of relapse. However, the crucial comparison is that between nonproblem drinkers and long-term abstainers. The results reveal a somewhat higher risk of relapse at four years among nonproblem drinkers than among long-term abstainers, although the difference is not statistically significant. This is some evidence for the second theory cited above. The data could be interpreted as meaning that although the relapse rate for nonproblem drinkers is not *absolutely* high, nonproblem drinkers do tend to relapse at a relatively higher rate than abstainers. However, that leaves one question remaining: Are these patterns of relapse *uniform* throughout our alcoholic sample?

This question is at the heart of the issue between the second and third conceptions of alcoholism cited above. The comprehensive study report [2] contains a considerable amount of multivariate analysis addressing the question of whether characteristics measured at admission

Table 11

RELAPSE PATTERNS AT FOUR YEARS

Status at 4 Years	Status at 18 Months			
	Abstaining 6 Months or More	Abstaining 1-5 Months	Nonproblem Drinking	Problem Drinking
Relapse Rate at 4 Years[a] (percent)	30	53	41	73
Alcohol-related Death Rate (percent)	1	9	3	9
(N)	(140)	(124)	(102)	(223)

[a]Problem drinking at 4 years, among survivors.

to treatment affect the relative relapse rate between nonproblem drinkers and abstainers. The analysis revealed several variables that were important in affecting relapse rates: severity of dependence symptoms, age, and marital status. All of these produced fairly complex, statistically significant interactions in logit regression models. The results show that rates of relapse between drinkers and abstainers are *not* uniform. On the contrary, relapse rates are subject to great variations depending on an alcoholic's characteristics at admission to treatment.

Table 12 shows one of the most important patterns from this analysis. The table entries are the predicted rates of relapse at the four-year followup, i.e., the percentage of subjects in a given group who, at the four-year followup, were found to be drinking with alcohol problems. The subjects are classified into four groups, first in terms of their characteristics at admission (dependence symptoms and age), and second, according to their drinking status at 18 months (long-term abstaining versus nonproblem drinking). The critical comparison is that of nonproblem drinkers versus six-month abstainers. The result is a large interaction. Among subjects who had high levels of dependence symptoms and who were older at admission, the relapse rates were much higher for nonproblem drinkers than for long-term abstainers. On the other hand, among subjects who had low levels of dependence and who were younger at admission, the relationship is reversed. For those subjects, relapse rates were lower for nonproblem drinkers than for abstainers.

The multivariate analysis also showed strong statistical interactions involving marital status. For example, among the groups who had high levels of alcohol dependence and who were younger at admission, and among those who had low levels of dependence and were older, the pattern was even more complex, because the relapse patterns were mediated by marital status. The basic thread of these patterns implies that the third conception of the relapse process is the one most consistent with the data. In particular, the results suggest that the risks of nonproblem drinking may not be unqualified. Rather, they depend on the person's characteristics and environment at the time he enters treatment.

Table 12

PREDICTED RELAPSE RATES AT FOUR YEARS
(Percent)[a]

Background Characteristics at Admission	Status at 18 Months	
	Abstaining 6 Months or More	Nonproblem Drinking
High level of dependence, age 40 or over	7	39
Low level of dependence, age under 40	24	5

[a]Percentage of specified subgroup who relapsed at 4 years, predicted from logit regression model.

Earlier, it was emphasized that both remission and relapse are frequent in this population. Table 13 shows the basis for that assertion. The data tabulated here represent two methods of assessing the long-term stability of drinking patterns. In the left column is a first approximation, made by classifying a subject's status at the two followup points. For example, "stable abstaining" represents those subjects who were abstaining for six months or more at both the 18-month point and the four-year point; such people constituted 13 percent of the sample. Nine percent were classified as nonproblem drinkers at both followup points. An additional six percent had changed from one remission category to another. Finally, the remaining 72 percent of the sample had been problem drinkers at one or both of those times. In other words, only 28 percent of this sample were in stable remission, judging from their status at the two followup points.

It must be remembered, moreover, that other changes could have occurred. For example, among the 13 percent classified as "stable abstaining" at both points, not all abstained during the entire period between admission and the four-year followup. In fact, as shown in the right-hand column of Table 13, we found that only 7 percent of the sample abstained throughout that four-year period. Almost all of the people who resumed drinking after abstaining had experienced significant drinking problems when they were drinking. We also found 7 percent of the sample who were stable, continuous nonproblem drinkers, in the sense that they were classified as nonproblem drinkers at both followups *and* they had not experienced serious alcohol incidents during any time in the four-year period. In addition, there were some subjects, including five percent of the sample, who appeared to be switching back and forth between long-term abstention and nonproblem drinking and who reported no serious alcohol problems at any other time. That leaves 81 percent of the sample who had serious drinking problems at one time or another during the four-year period. This documents once again the pervasiveness of instability in this sample.

Table 13

STABILITY OF DRINKING PATTERNS
(Percent of Sample)

Category	Stability Across Two Followups[a]	Continuous Stability Throughout 4 Years[b]
Stable abstaining	13	7
Stable nonproblem drinking	9	7
Abstaining/nonproblem drinking	6	5
Problem drinking	72	81

[a]"Stable abstaining" = long-term abstaining (6 months or more) at both the 18-month and four-year followups. "Stable nonproblem drinking" = nonproblem drinking at both followups. "Abstaining/nonproblem drinking" = long-term abstaining at one followup, nonproblem drinking at the other.

[b]"Stable abstaining" = abstaining throughout the four-year period from admission to followup. "Stable nonproblem drinking" = nonproblem drinking at both the 18-month followup and the four-year followup *and* no serious alcohol-related problems during the four-year period. "Abstaining/nonproblem drinking" = long-term abstaining at one followup, nonproblem drinking at the other followup, *and* no serious alcohol-related incidents during the four-year period.

CONCLUSIONS

The results of the four-year followup study imply one fundamental fact about the disorder: *Alcoholism is a chronic, unstable condition.* Among persons who come to formal treatment, alcoholism appears to be a continuing condition for the great majority of patients. This is not to say that there is no improvement. On the contrary, our data show that remissions are frequent. However, remissions are generally intermittent rather than stable.

The data imply that *remission occurs in two forms: both long-term abstention and nonproblem drinking.* We have found that these two groups have roughly equivalent levels of social adjustment, mental health, and physical condition. Compared with other alcoholics, persons in either remission group have much lower rates of alcohol-related mortality, and lower rates of relapse.

When one examines areas of life apart from drinking, one finds *only modest improvements in social adjustment.* The cohort in this study improved slightly in levels of earnings and unemployment, but did not change significantly on other measures of adjustment. Whether other methods of treatment or intervention could lead to greater changes is an open question. It is clear, however, that in this sample, social rehabilitation did not occur as frequently as remission of alcohol problems.

Finally, we found that *the risk of nonproblem drinking varies substantially among different subgroups of alcoholics.* In particular, among subjects who were highly dependent on alcohol and who were 40 or over at admission to treatment, relapse rates were lower for long-term abstainers than for nonproblem drinkers. Yet among subjects who were less dependent and under 40, the relationship was reversed. This is not consistent with those conceptions of alcoholism holding that any form of drinking will inevitably lead to relapse. However, the data are consistent with a view that treats alcohol dependence as a variable property of individuals. The level of dependence appears to make a substantial difference in the risks of drinking.

Alcoholics, then, do not appear to make up a unitary, homogeneous group. Rather, alcoholism occurs in a variety of forms and is arrayed

along a number of different dimensions. It is clear that alcohol dependence is a dimension of preeminent importance, and that it plays a very important role in the course of alcoholism. At low levels of alcohol dependence, nonproblem drinking may represent a feasible mode of adjustment, whereas with increasing dependence levels the risks of nonproblem drinking become proportionately greater. Beyond this, the processes that underlie the patterns of remission and relapse remain incompletely understood. Further advances in prevention and treatment of alcoholism will depend on better understanding of these processes, and on recognizing the heterogeneity within the alcoholic population.

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